REMARKS

The present Response After Final Official Action Pursuant to 37 CFR 1.116 is filed in response to the Final Official Action mailed July 24, 2009 and within two months of the mailing date of the Final Official Action. The Applicant respectfully requests entry of the following before reconsideration of the present Application and the allowance of the present Application, or an Advisory Action if the Examiner deems such to be necessary.

Claims 23-32 and 34-36 are presently pending in the Application and the Examiner has again rejected claims 23-32 and 34-36 under 35 U.S.C. § 102(b) over Hawarden et al. '474 (U.S. Patent No. 6,231,474) for the same reasons as presented in the previous Official Action of February 27, 2009. The Applicant acknowledges and respectfully traverses the raised rejection in view of the following remarks.

The Applicant has considered the Examiner's stated grounds for rejection of the claims under 35 U.S.C. 102 over Hawarden et al. '474 and the Examiner's response to the previously submitted arguments distinguishing the claims over Hawarden et al. '474 and is of the impression that the Examiner has apparently misapprehended or has chosen to ignore certain fundamental and essential teachings by Hawarden et al. '474 and corresponding fundamental recitations and limitations of the claims presently under consideration by which the present claims are fully and patentably distinguished over and from Hawarden et al. '474.

As stated in paragraph [013], it is the purpose of the invention to provide method for control of an automatic transmission by which a subsequent immediate continuation of travel is always achieved with an appropriate gear stage of the transmission without having to take into consideration the disadvantage of excessive motor torque at low driving speeds or high transmission ratios in low gear stages. More specifically, and as discussed in the Response to the Official Action of February 27, 2009, the present invention as recited in independent claims 23, 34 and 36, the recitations of which are incorporated into all dependent claims by dependency therefrom, is directed to a method for operating an automatic transmission of a motor vehicle when the transmission is in a coasting mode and in anticipation of the driver's desires upon exiting the coasting mode and, in particular, to a method for executing a downshift in an automatic clutch, when the transmission is in the coasting mode without any engine braking. As recited in claims 23, 34 and 36, the method of the present invention for executing automatic transmission downshift, when the transmission is in a coasting mode, includes the steps of (a) *carrying out a first downshifting operation during a coasting mode without any engine braking.* Depending upon the speed of the vehicle after the completion of the downshift,

one of (b1) *terminating the first downshifting operation by engagement of the clutch if a speed of the vehicle is above a predetermined threshold speed*; or (b2) *terminating the first downshifting operation without engagement of the clutch if the speed of the vehicle is at or below the predetermined threshold speed.* With the clutch disengaged and with a downshift occurring at a speed less than the predetermined threshold speed, this ensures that no brake torque will be generated by the drive engine in view of engaging a low transmission gear stage(s).

To reiterate and emphasize, the downshifting method of the present invention is initiated and performed only when the vehicle is initially in a *coasting mode*, that is, when the engine is not driving the wheels of the vehicle and the vehicle is not being braked in any manner, e.g., either by applying the conventional brake(s) or utilizing engine braking. Further, depending upon the vehicle speed following completion of the downshift, the clutch is either engaged (*if a speed of the vehicle is above a predetermined threshold speed*) and remains disengaged (i.e., *if the speed of the vehicle is generally at or below the predetermined threshold speed*).

Hawarden et al. `474 relates to and describes a method for controlling the engine speed at which an automatic transmission performs downshifts when and only when the engine brake is engaged, that is, when the engine to transmission clutch is engaged slowing the vehicle or when both the engine brake and the foot brake are both engaged.

As stated in the Response to the Official Action of February 27, 2009, it is therefore apparent that there are a number of fundamental and patentable distinctions between the present invention, as recited in claims 23, 34 and 36 and in the associated dependent claims, and the teachings of Hawarden et al. `474. For example, the presently claimed invention is fully distinguished over and from the teachings of Hawarden et al. `474 because the method of the present invention requires the vehicle to be in a *coasting mode, not an engine braking mode of operation.* In complete contrast from the present invention as recited in the claims, the Hawarden et al. `474 method allows a downshift to be initiated and performed when and only when the driver is either using engine braking or engine braking in combination with the foot brake, which requires that the clutch located between the engine and transmission be engaged during the period immediately before a downshift. The Hawarden et al. `474 method, therefore, is either accelerating or engine braking and does not even contemplate a coasting mode per se, let alone a coasting mode according to the present invention in which the engine is not driving the wheels of the vehicle and the vehicle is not being braked in any manner, e.g., either

by applying the conventional brake(s) or utilizing engine braking and, as a consequence of the coasting mode of operation, engine braking (or conventional braking) is not occurring.

Further in this regard, the Examiner refers in the Response to Arguments to column 4, lines 29-37 of Hawarden et al. '474 that where that reference discloses performing a downshift to maximize engine brake when the vehicle is descending/coasting down hills.

The Applicant first notes that the Examiner states in the Response to Arguments that the Hawarden et al. '474 method performs a downshift to maximize engine braking when descending a hill. If, however, a downshift is performed to maximize engine braking when descending a hill, then the vehicle must in an engine braking mode when descending the hill-not a coasting mode–which means that a clutch between the engine and transmission must be engaged to provide the facilitate the desired engine braking. It is respectfully submitted that the vehicle, therefore, cannot be in a coasting mode– as required by the presently claimed invention–because the coasting mode requires that the engine not be driving the wheels of the vehicle and the vehicle not be braked in any manner, e.g., either by utilizing engine braking or applying the conventional brake(s). It is to be appreciated that the presently claimed coasting mode specifically means that the engine cannot be providing engine braking–the claims now specifically recite a *coasting mode without any engine braking*. As a consequence, the Applicant is somewhat puzzled because the Examiner's statements, as worded, seem to contradict the Examiner's conclusion.

Therefore considering Hawarden et al. '474 directly, and in particular considering column 3, line 21 through column 4, line 51 of Hawarden et al. '474, which includes the portion of Hawarden et al. '474 cited by the Examiner together with the context of the statements from Hawarden et al. '474 that were selected by the Examiner, Hawarden et al. '474 describes the downshift control as follows, with emphasis being added by the Applicant where appropriate:

> The **downshift control of the present invention to provide enhanced vehicle retardation in response to sensed actuation of the engine brake and/or engine and foot brake systems** may be seen by reference to FIG. 2. FIG. 2 is a graphical representation of shift point profiles utilized to determine when shift commands should be issued by the ECU 28 to the shift actuator 52. Solid line 60 is the default upshift profile, while solid line 62 is the default downshift profile. As is known, if the vehicle is operating to the right of upshift profile 60, an upshift of transmission 14 should be commanded, while if the vehicle is operating to the left of downshift profile 62, a downshift should be commanded. If the vehicle is operating in between profiles 60 and 62, no shifting of the transmission is then required. At or below a certain engine speed, ESD/S, a downshift will be commanded. As is discussed in detail in aforementioned U.S. Pat. No. 4,361,060, the shift profiles may be modified or moved in response to certain sensed vehicle operating conditions to provide enhanced drive line performance. To provide enhanced vehicle retardation, the downshift profile

(i.e., the engine speed ESD/L at which downshifts are commanded) is moved, as will be discussed in detail below.

Upon sensing manual actuation of the engine brake 46, the system will react to force an early downshift by shifting the downshift profile rightwardly (i.e., increasing the engine speed at which a downshift will be commanded, thereby increasing the speed of the engine upon completion of a downshift). In the example illustrated in FIG. 2, if operation of the engine brake EB is set and/or operation of the engine brake and operation of the foot brake system is set, the downshift profile will be shifted rightwardly, as indicated by shift profile 66. Shift profile 66 will result in an earlier downshift and a relatively elevated engine speed at completion of the forced downshift. By way of example, at lower throttle position values, if the default downshift value is about 950 RPM, the forced downshift value of profile 66 will be about 1300-1400 RPM.

If engine braking but not foot braking is set, upon forcing a downshift, the control will command a downshift to bring engine speed to about 1400-1700 RPM; if engine braking and foot braking are set, the control will command a downshift to bring engine speed to between about 1700-2000 RPM. Operating at such elevated engine speeds will result in enhanced engine brake effectiveness in retarding the speed of the vehicle.

If engine braking but not foot braking is set and vehicle speed is above a given value (i.e., about 30 MPH), after a forced downshift (i.e., a downshift from profile 66), the downshift profile will return to the default value 62 thereof. If engine braking but not foot braking is set and vehicle speed is below the set value (i.e., OS<REF), then the downshift profile is caused to assume a profile value 64 intermediate default profile 62 and the forced downshift profile 66. By way of example, if at lower throttle positions the default profile 62 value is about 950 RPM and the forced downshift profile 66 value is about 1300-1400 RPM, then the value on profile 64 will be about 1100 RPM.

If engine braking and foot braking both are set, the forced downshift profile 66 will remain effective. If the engine brake is activated, the system raises the downshift point to approximately 1300-1400 RPM (the value is two ratio steps down from the maximum engine speed). The downshift made under these conditions, if any, brings the engine speed to between 1400-1700 RPM, allowing the driver a moderate level of engine braking.

If the engine brake is pressed and the foot/service brake is pressed, or if the two are pressed together, then the system will raise the downshift point to approximately 1300-1400 RPM. The system will make a downshift, if necessary, to bring the engine speed to between 1700-2000 RPM to give a maximum level of engine braking. As the vehicle slows down, it will downshift again when it reaches the raised dsownshift point (1300-1400 RPM) and make a skip downshift to bring the engine speed up to approximately 2000 RPM.

As long as the driver keeps his foot on the engine brake (he may release the foot brake if he wishes), the system will remain in this state. While in this mode, if the driver removes his foot from the foot brake, the system will remain in this mode. If the driver then reapplies the foot brake while maintaining the engine brake on, the system will make a downshift if possible (usually a single) to raise the engine speed as high as possible. This assists in maximizing engine brake performance when descending hills.

In summary, there are two enhanced braking states, engine-brake-only and engine-brake-plus-foot-brake. Engine-brake-only gives moderate engine speeds and a moderate level of engine braking (single shifts, skips at lower vehicle speeds). Engine-brake-plus-foot-brake gives higher engine speeds for a maximum level of engine braking (skip shifts, though the first shift may be a single to get it into the 1700-2000-RPM range, for example, 1800-1900 RPM). The driver may switch between the two states very easily, for example, touching the foot brake while in engine-brake-only mode changes to engine-brake-plus-foot-brake. Also, if the driver is in engine-brake-

plus-foot-brake mode (foot off foot brake) and briefly releases the engine brake, he will revert to engine-brake-only mode."

It is therefore apparent from consideration of the entire disclosure by Hawarden et al. '474 that the Hawarden et al. '474 method requires that *engine braking be applied*, that is, that the clutch between the engine and transmission must be engaged so that the engine is slowing the speed of the vehicle. It is also apparent that if the vehicle is in an engine braking mode of operation, the vehicle thus cannot be in a *coasting mode* which, by all commonly accepted definitions and understanding of the term "coasting", requires that the engine is not driving the wheels of the vehicle and the vehicle is not being braked in any manner, namely, either by utilizing engine braking or applying the conventional brake(s).

The present invention as recited in the claims presently under consideration, however, requires that the downshifting method be initiated and performed when, and only when, the vehicle is initially in a coasting mode, that is, the engine is not driving the wheels of the vehicle and the vehicle is not being braked in any manner, namely, either by utilizing engine braking or applying the conventional brake(s). It is therefore apparent that, instead of teaching or suggesting the present invention under the requirements and provisions of 35 U.S.C. 102 or 35 U.S.C. 103, the teachings of Hawarden et al. '474 are in direct opposition to and contradiction of the present invention as recited in the claims.

In order to emphasize this distinction, however, which is already present in the claims as presented herein above by the recitation of "carrying out a first downshifting operation during a coasting mode" of the automatic transmission from a higher gear to a lower gear, the Applicant further elects to submit the above amendment to claims 23, 34 and 36, and thus also to the dependent claims, which further clarify the meaning of "in a coasting mode" by reciting that in the coasting mode is occurring "without any engine braking" to specifically exclude the possibility of engine braking somehow is included as part of the coasting mode of operation. In addition, each of the independent claims now recite that the downshift is terminated by "engagement of the clutch, located between the vehicle drive motor and the transmission, if a speed of the vehicle is above a predetermined threshold speed" or terminated "without engagement of the clutch, located between the vehicle drive motor and the transmission, if the speed of the vehicle is below the predetermined threshold speed." Such features are believed to clearly and patentably distinguish the presently claimed invention from all of the art of record, including the applied art. It will also be noted that these amendments are fully supported by the

specification and claims as originally filed and do not add any new matter to the present invention, the specification or the claims.

It is therefore apparent that the present invention as recited in claims 23, 34 and 36 and thus in the associated dependent claims is, for at least the reasons discussed above, completely and fully distinguished over and from the teachings of Hawarden et al. `474 under the requirements and provisions of 35 U.S.C. 102 and 35 U.S.C. 103. The Applicant accordingly respectfully requests that the Examiner reconsider and withdraw all rejections of the claims over the cited prior art, and the allowance of the claims as presented herein above.

It must also be noted that the present invention as recited in claims 23, 24 and 36, as well as the dependent claims, is still further distinguished over and from Hawarden et al. `474 because the method of Hawarden et al. `474 determines the downshift speed, that is, the speed at which a downshift should occur, as a function of the engine speed, and whether the driver is using engine braking or the combination of engine braking with foot braking.

According to the present invention, and in distinct contrast to Hawarden et al. `474, the determination of whether or not a downshift is executed is a function of not only the vehicle speed but whether or not the vehicle is in a coasting mode or not in a coasting mode. The present invention is, therefore, fully independent of either engine braking and foot braking, while Hawarden et al. `474 does not even mention or consider whether the vehicle is in a coasting mode or not.

Again, therefore, it is apparent that the present invention as recited in claims 23, 34 and 36, as well as the associated dependent claims, are, for at least the reasons discussed above, completely and fully distinguished over and from the teachings of Hawarden et al. `474 under the requirements and provisions of 35 U.S.C. 102 and 35 U.S.C. 103. The Applicant accordingly respectfully requests that the Examiner reconsider and withdraw all rejections of the claims over the cited prior art, and the allowance of the claims as presented herein above.

If any further amendment to this application is believed necessary to advance prosecution and place this case in allowable form, the Examiner is courteously solicited to contact the undersigned representative of the Applicant to discuss the same.

In view of the above amendments and remarks, it is respectfully submitted that all of the raised rejection(s) should be withdrawn at this time. If the Examiner disagrees with the Applicant's view concerning the withdrawal of the outstanding rejection(s) or applicability of the Hawarden et al. `474 reference, the Applicant respectfully requests the Examiner to indicate the specific passage or passages, or the drawing or drawings, which contain the necessary

teaching, suggestion and/or disclosure required by case law. As such teaching, suggestion and/or disclosure is not present in the applied references, the raised rejection should be withdrawn at this time. Alternatively, if the Examiner is relying on his/her expertise in this field, the Applicant respectfully requests the Examiner to enter an affidavit substantiating the Examiner's position so that suitable contradictory evidence can be entered in this case by the Applicant.

In view of the foregoing, it is respectfully submitted that the raised rejection(s) should be withdrawn and this application is now placed in a condition for allowance. Action to that end, in the form of an early Notice of Allowance, is courteously solicited by the Applicant at this time.

The Applicant respectfully requests that any outstanding objection(s) or requirement(s), as to the form of this application, be held in abeyance until allowable subject matter is indicated for this case.

In the event that there are any fee deficiencies or additional fees are payable, please charge the same or credit any overpayment to our Deposit Account (Account No. 04-0213).

Respectfully submitted,

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